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GRANT FROM THE J. LAWRENCE SMITH FUND

No. 7, George Perkins Merrill, U. S. National Museum, $500. To further aid his studies of rare meteorites.

GRANT FROM THE MARSH FUND

John M. Clark, State Hall, Albany, $400. For a study of mutualism, symbiosis, and dependent life among animals of geologic time.

REPORT OF THE AUTUMN MEETING

Prepared by the Home Secretary

The Autumn Meeting of the Academy was held in the buildings of the Massachusetts Institute of Technology at Cambridge, on November 13, 14, 15, 1916.

Seventy members were present as follows: Messrs. C. G. Abbot, H. L. Abbot, Barus, Baxter, Becker, Boas, Bogert, Boltwood, Bumstead, Cannon, Castle, Cattell, Chittenden, W. B. Clark, J. M. Clarke, Comstock, Conklin, Crafts, Crew, Cross, Davenport, Davis, Day, Farlow, Fewkes, Folin, Goodale, Hale, E. H. Hall, Harper, Harrison, Hayford, Holmes, Howard, Howell, Iddings, Jackson, Leuschner, Lewis, Lindgren, Lusk, Mall, Mark, Mayer, Meltzer, Mendel, Michelson, Morley, E. S. Morse, A. A. Noyes, H. F. Osborn, T. B. Osborne, Parker, Pearl, Pickering, Prudden, Reid, Richards, Rosa, Scott, Story, Thomson, Van Hise, Walcott, Webster, Welch, Wheeler, D. White, Wilson, R. W. Wood.

BUSINESS SESSIONS

The Home Secretary announced the following deaths since the last Annual Meeting of the Academy: Cleveland Abbe, elected 1879, died October 28, 1916; Josiah Royce, elected 1906, died September 14, 1916; also Sir William Ramsay, Foreign Associate, elected 1904, died July 24, 1916.

The Home Secretary announced that the following publications had been issued since the Annual Meeting: Proceedings, vol. 2, numbers 5–11; *Memoirs*, volume 14, first memoir, by George P. Merrill, consisting of a Report on Researches on the Chemical and Mineralogical Composition of Meteorites, with Especial Reference to Their Minor Constituents; Biographical Memoirs of George William Hill by Ernest W. Brown, and of Theodore N. Gill by William H. Dall.

Under the rules of the Academy the following members of the Editorial Board of the Proceedings retire on December 1, 1916: W. B. Cannon, J. McK. Cattell, J. M. Coulter, S. Flexner, R. G. Harrison. The Home Secretary announced that the following members have been appointed by the Council to serve in their places until December 1, 1919; H. H. Donaldson, R. A. Harper, Graham Lusk, A. G. Mayer, A. A. Noyes. Raymond Pearl was appointed to succeed A. A. Noyes as Chairman of the Editorial Board.

The Home Secretary also announced that an Auditing Committee has been appointed consisting of W. H. Dall, chairman, A. L. Day, and F. W. Clarke;

and that a Committee on the Organization of the Scientific Resources of the Country for National Service was appointed by the Council as follows: G. E. Hale, chairman, Simon Flexner, E. G. Conklin, R. A. Millikan, A. A. Noyes. This last Committee presented a detailed report recommending the organization of the National Research Council.

The Home Secretary also announced that a Committee on Nitrate Supply was appointed at the request of the Secretary of War to present to the War Department "a report containing such information as will aid the department, to the greatest degree which the Academy finds practicable, in reaching a conclusion as to the best method to be followed in the manufacture of nitric acid by a process not involving dependence upon a foreign source of supply, the report to take into consideration the legislation contained in Section 124 of the National Defense Act approved June 3, 1916." The following men were appointed members of this Committee by the President of the Academy: Arthur A. Noyes, chairman, Leo H. Baekeland,* Gano Dunn, Charles H. Herty,* Warren K. Lewis,* Michael I. Pupin, Theodore W. Richards, Elihu Thomson, Willis R. Whitney.* Those against whose name an asterisk is placed were named by the President of the American Chemical Society.

The President announced that he had forwarded a preliminary report on the National Research Council to the President of the United States.

The following new members were presented to the Academy: M. T. Bogert, L. O. Howard, A. G. Mayer, Raymond Pearl.

The Treasurer reported that notice had been received from the attorneys for Mr. W. W. Farnam, the executor of the estate of Othniel C. Marsh, that he had filed in the New Haven probate court a supplemental account as executor which showed a balance of interest due the Academy of $6,921,84.

The resolution in regard to a section of engineering which was proposed by the Council and adopted at the Business Session of the Academy on April 17, 1916, was presented, and it was voted that a copy of the resolution be sent to each member of the Academy. The resolution is as follows:

> Voted that a section of engineering be developed which shall include men who have made original contributions to the science or art of engineering; that to this end the present section of physics and engineering be designated the section of physics, and that the Council, under the authority granted by section 4, article 4, of the Constitution, nominate to the Academy, after inviting suggestions from the members of the Academy, two or three engineers each year until such time as it shall seem advisable to establish a separate section of engineering, any engineers elected as the result of such nominations being in the meantime assigned to that one of the existing sections to which their work is most closely related.

The following amendments to the Constitution reported from the Council and returned to the Academy from the Committee of the Whole with favorable recommendation were considered:

> That article 3, section I, line 3, of the Constitution be amended by substituting the word "fourth" for "third" in the phrase specifying that the Annual meeting shall begin "on the third Monday in April."
>
> That the last sentence of section 5, article 4, of the Constitution be stricken out.

The first of these amendments was rejected and the second one was adopted.

A new amendment to the Constitution was offered providing that article III, section I, in regard to the meetings of the Academy be amended so as to read as follows:

> Article III, section 1. The Academy shall hold one stated meeting in each year, called the annual meeting, in the city of Washington and another, called the autumn meeting, both to be held at such place and time as the Council shall determine, provided that the annual meeting shall be held in April.

This proposed amendment was referred to the Council.

Mr. C. R. Van Hise presented the report of the Committee on the Panama Canal Slides. It was voted that the printing of the final report be referred to the Council with power.

It was voted that the Home Secretary be directed to send copies of the minutes of each Business Session of the Academy to all members of the Academy for approval and correction.

It was voted that papers by non-members appearing in the PROCEEDINGS be announced as 'communicated by' some member.

It was voted on recommendation of the Committee on the J. Lawrence Smith Fund that a grant of $500 be made from that fund to Mr. George Perkins Merrill to further aid his studies of rare meteorites.

It was voted on recommendation of the Committee on the Marsh Fund that a grant of $400 be made from that fund to Mr. John M. Clark for a study of mutualism, symbiosis, and dependent life among animals of geologic time.

SCIENTIFIC SESSIONS

Two public lectures were given on November 13, by President W. H. Welch on The Formation of the National Research Council at the Request of the President of the United States; and by S. W. Stratton, Director of the National Bureau of Standards, Washington, on Target Practice in the Navy and Some of the Research Problems Involved, illustrated with moving pictures. There followed a public Scientific Exhibit (see list of exhibits, below).

At a joint session of the Academy and of the National Research Council on November 14 three public lectures were given by George E. Hale, Chairman of the National Research Council, on The Work of the National Research Council and on Recent Observations of Organized Science in England and France; by Lieut. Col. George O. Squier, Chief of Aviation, U. S. Army, on Scientific Research for National Defense, as illustrated by the Problems of Aviation; and by Arthur A. Noyes, Massachusetts Institute of Technology, on The Nitrogen Problem in War and in Agriculture.

Two public scientific sessions were held on November 13 and 14 at which the following papers were presented (an asterisk denotes presentation only by title):

RAYMOND PEARL, Maine Agricultural Experiment Station: Some effects of the continued administration of alcohol to the domestic fowl, with special reference to the progeny.

ALFRED G. MAYER, Marine Laboratory, Carnegie Institution: Further studies of nerve conduction.

E. G. CONKLIN, Princeton University: The share of egg and sperm in heredity.

LAFAYETTE B. MENDEL and S. E. JUDSON, Yale University: Some inter-relations between diet, growth, and the chemical composition of the body.

CHARLES P. OLIVIER, University of Virginia (read by E. W. Morley): The meteor system of Pons-Winnecke's comet. 129 parabolic orbits of meteor streams.

ALESSANDRO FABBRI (introduced by A. G. Mayer): Micro-cinematographs of marine and freshwater organisms.

A. G. WEBSTER, Clark University:* Practical tests of a new phonotrope.

EDWARD S. MORSE, Salem, Mass:* Protoconch of Solemya.

JACQUES LOEB, Rockefeller Institute:* Diffusion and secretion.

HENRY L. ABBOT, Cambridge, Mass:* Hydrology of the Isthmus of Panama.

JOHN M. CLARK, State Museum, Albany:*The Strand and the Undertow.

W. LINDGREN, Mass. Inst. of Tech:. *Notes on the deposition of quartz, chalcedony, and opal.

W. M. DAVIS, Harvard University:*Sublacustrine glacial erosion in Montana.

H. F. OSBORN, American Museum of Natural History: *The tyrant (Tyrannosaurus) and the ostrich (Struthiomimus) dinosaur. The relation of Newton's and Darwin's laws to the fundamental biologic law.

EDWIN H. HALL, Harvard University: Electric conduction in metals.

EDWARD B. ROSA, National Bureau of Standards: The silver voltameter as an international standard.

R. W. WOOD, Johns Hopkins University: One-dimensional gases and the reflection of molecules. Series in resonance spectra.

ELIHU THOMSON, Swampscott, Mass.: Inferences concerning auroras.

A. A. MICHELSON, University of Chicago: Report of progress in experiments for measuring the rigidity of the earth. The laws of elastico-viscous flow.

C. G. ABBOT, Smithsonian Institution: On the preservation of knowedge.

FRANZ BOAS, Columbia University: Further evidence regarding the instability of human types.

ROSS G. HARRISON, Yale University: Transplantation of limbs.

CHAS. B. DAVENPORT, Station for Experimental Evolution, Carnegie Institution: Heredity of stature.

F. R. MOULTON, Chicago University: *On analytic functions of infinitely many variables.

HENRY S. WHITE, Vassar College, F. N. COLE and LOUISE D. CUMMINGS:* Enumeration of all triad systems on fifteen elements.

WILLIAM E. STORY, Clark University: *Some variable 3-term scales of relation.

EDW. L. NICHOLS, Cornell University: *New data on the phosphorescence of certain sulphides.

G. P. BAXTER and H. W. STARKWEATHER, Harvard University: *A revision of the atomic weight of tin.

T. W. RICHARDS and H. S. DAVIS, Harvard University: *Improvements in calorimetric combustion.

T. W. RICHARDS and C. WADSWORTH, 3d, Harvard University: *Further study of the atomic weight of lead of radioactive origin.

GILBERT N. LEWIS, University of California. *Chemical affinity.

WM. TRELEASE, University of Illinois: *The American oaks.

H. S. JENNINGS, Johns Hopkins University: *The numerical results of diverse systems of breeding, with relation to two pairs of factors, linked or independent.

W. R. MILES, Carnegie Nutrition Laboratory, Boston (introduced by F. G. Benedict): *Some psycho-physiological processes as affected by alcohol.

Walter B. Cannon, Harvard University: *Oscillatory variations in the contraction of rhythmically stimulated muscles.

Wm. H. Dall, Smithsonian Institution: *On some anomalies in the distribution of Pacific coast mollusca.

G. H. Parker, Harvard University: *The responses of hydroids to gravity.

W. M. Wheeler, Harvard University: *The phylogenetic development of subapterous and apterous castes in the Formicidae.

W. J. Crozier, Resident Naturalist, Bermuda Biological Station (introduced by E. L. Mark): *On cell penetration by acids: the chloracetic acids. *On the immunity coloration of some nudibranches.

Hovey Jordan, Bermuda Biological Station (introduced by E. L. Mark): *The rheotropism of the marine fish known as "hamlet" or "grouper" (*Epenephalus striatus*).

A. C. Walton, Harvard University (introduced by E. L. Mark): *The occurrence of *Ascaris triquetra*, Schrank, in dogs.

The following is the list of scientific exhibits prepared for the meeting of the Academy.

H. S. White, Vassar College: Graphic representations of triad systems.

Miss A. J. Cannon, Harvard College Observatory: Stellar spectra.

Leon Campbell, Harvard College Observatory: Visual observation of variable stars.

Miss H. S. Leavitt, Harvard College Observatory: Photographic magnitudes.

Solon I. Bailey, Harvard College Observatory: Variable stars in clusters.

A. G. Webster, Clark University: Acoustical measuring apparatus: standard phone, phonometer and phonotrope. Application of a drop chronograph for use in ballistics.

Charles A. Kraus, Clark University: A new vacuum pump and a new thermostat.

H. P. Hollnagel, Mass. Inst. Technology: Methods of isolating the infra-red region of the spectrum.

Alexander McAdie, Blue Hill Observatory: Cloud studies, wind structure and snow flakes.

Ellsworth Huntington, Milton, Mass.: The relation between solar changes and barometric gradients. Optimum temperature for the human race.

Robert DeC. Ward, Harvard University: Weather types of the United States, illustrated by composite weather maps and instrumental records.

R. A. Daly and H. Clark, Harvard University: Design for a deep-sea thermograph.

Frank Hall, Mass. Inst. Technology: A thermophone arranged so that direct comparison may be made with a magnetic receiver.

A. H. Gill, Mass. Inst. Technology: Tests of lubricating mineral oils.

F. G. Keyes and J. B. Dickson, Mass. Inst. Technology: Continuous flow calorimeter for measuring heats of reaction in solution.

C. L. Burdick, Mass. Inst. Technology: Determination of crystal structure by X rays.

R. E. Wilson, Mass. Inst. Technology: Apparatus for maintaining pressures of one-tenth micron or less, and the investigation of the mechanism of chemical reactions.

Henry Fay, Mass. Inst. Technology: Erosion of large guns.

Albert Sauveur, Mass. Inst. Technology and Harvard University: 1. Photomicrographic apparatus (original). 2. Photomicrographs of metals and alloys; charts and diagrams; specimens.

H. O. Hofman, Mass. Inst. Technology: 1. Jenny flotation machine. 2. A laboratory revolving horizontal roasting furnace heated electrically and rotated in the same way.

A. E. Kennelly and Associates, Mass. Inst. Technology: Researches in electrical engineering.

Alexander Klemin, Mass. Inst. Technology: Aeroplane models used in wind tunnel.

W. Lindgren and W. L. Whitehead, Mass. Inst. Technology: Photomicrographs of silver ores from Chile and Tintic.

C. H. Warren, Mass. Inst. Technology: 1. A graduated sphere for crystallographic work. 2. Photographs of spherulites in polarized light.

Charles Palache, Harvard University: Models showing gnomonic crystal projection.

Wallace W. Atwood, Harvard University: The former glaciers of the San Juan mountains of Colorado. The physiographic stages in the evolution of the San Juan mountains of Colorado.

J. B. Woodworth, Harvard University: Glacial map of Cape Cod and adjacent islands. A glypolith from Nantucket.

Laurence La Forge, U. S. Geological Survey: Recent topographic and geologic maps of New England and other parts of the United States.

U. S. Coast and Geodetic Survey: Recent charts of the coasts of the United States.

John M. Clarke, State Museum, Albany, N. Y.: Portfolio of paleontological plates, in press. Plates of "Wild flowers of New York," in press. Geological map of Ogdensburg, N. Y., and vicinity, in press.

H. W. Shimer, Mass. Inst. Technology: Evolution of some brachiopods.

Richard M. Field, Harvard University: Ordovician rocks and faunas of central Pennsylvania.

W. B. Scott, Princeton University: Proofs of plates for forthcoming report on paleontology of Patagonia.

W. J. V. Osterhout, Harvard University: Pigments produced by the oxidation of a colorless plant chromogen.

Charles W. Johnson, Boston Society of Natural History: Distribution and variation of Helix hortensis.

Joseph A. Cushman, Boston Society of Natural History: Some fossil and recent foraminifera.

Alfred G. Mayer, Marine Laboratory, Carnegie Institution: Yacht and laboratory of the Carnegie Institution at Tortugas, Florida.

Hubert Lyman Clark, Museum of Comparative Zoölogy, Harvard University: Echinoderms from Torres straits, Australia, with colored drawings and lithographs.

G. H. Parker, Harvard University: The suction efficiency of a Californian sea-anemone.

W. T. Bovie, Harvard University: Visible effects of Schumann rays on protoplasm. Effects of radium rays on permeability of protoplasm.

C. T. Brues, Bussey Institution, Harvard University: Specimens and charts illustrating insects as carriers of infantile paralysis.

W. E. Castle, Bussey Institution, Harvard University: Examples of Mendelian inheritance, reversion and variety formation in rats and guinea-pigs.

Francis G. Benedict, Nutrition Laboratory, Carnegie Institution: Respiration apparatus for animals.

T. B. Osborne, Connecticut Agricultural Experiment Station, and L. B. Mendel, Sheffield Scientific School, Yale University: Photographs representing the growth of chickens fed with definite mixtures of food stuffs under laboratory conditions which have heretofore not led to success.

I. Chandler Walker, Medical Service, Peter Bent Brigham Hospital: Proteid sensitization in relation to bronchial asthma.

H. S. Wells, Medical Service, Peter Bent Brigham Hospital: Electrocardiography, or the application of the string galvanometer to the study of cardiac cases.

Albert A. Ghoreyeb, Cancer Commission, Harvard University: Metal casts of heart and kidney blood vessels.

S. B. Wolbach, Harvard Medical School: Studies in Rocky mountain spotted fever.

Harvey Cushing and W. M. Boothby, Peter Bent Brigham Hospital: Apparatus of routine methods for clinical metabolism determinations.

E. W. Goodpasture, Peter Bent Brigham Hospital: An anatomical study of senescence, with especial reference to tumors.

E. E. Tyzzer and C. C. Little, Harvard Medical School: The inheritance of susceptibility to transplanted tumor.

W. Duane, Harvard Medical School: The technique of the preparation of radium for therapeutic purposes.

G. C. Whipple, School for Health Officers, of Harvard University and Mass. Inst. Technology: Charts showing organization and membership of the School.

W. T. Sedgwick, Mass Inst. Technology: 1. Diagrams and tables illustrating the investigations of Professor Weston and Mr. Turner upon "The digestion of sewage effluents in an otherwise unpolluted stream." 2. An investigation of the behavior of certain species of bacteria in various materials between zero Centigrade and zero Fahrenheit. 3. A field investigation of the sanitary environment of a suburban population.

S. C. Prescott, Mass. Inst. Technology: Diseases of the banana in Central America and their control.

Alfred M. Tozzer, Peabody Museum, Harvard University: Race-mixture in Hawaii.

Charles Peabody, Peabody Museum, Harvard University: Prehistoric specimens from caves of France and Palestine.

E. A. Hooton, Peabody Museum, Harvard University: Casts and reconstruction of ancient man skull of apes.

S. J. Guernsey, Peabody Museum, Harvard University: Cave explorations in northeastern Arizona.

Oric Bates, Peabody Museum, Harvard University: Prehistoric Libyan remains.